

# Tomorrow's Electric Infrastructure

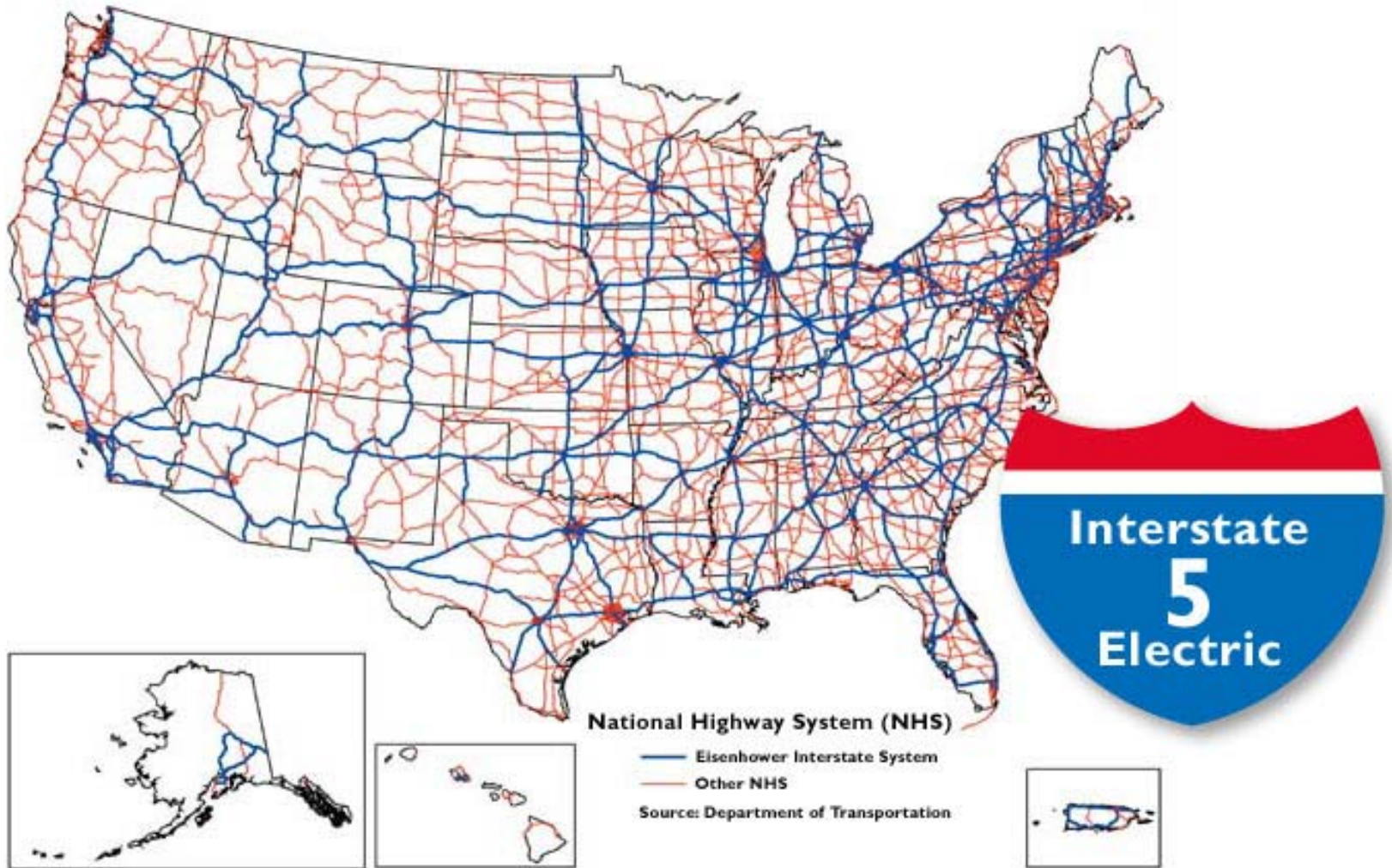
Clark Gellings  
Vice President

An Initiative by EPRI and the  
Electricity Innovation Institute

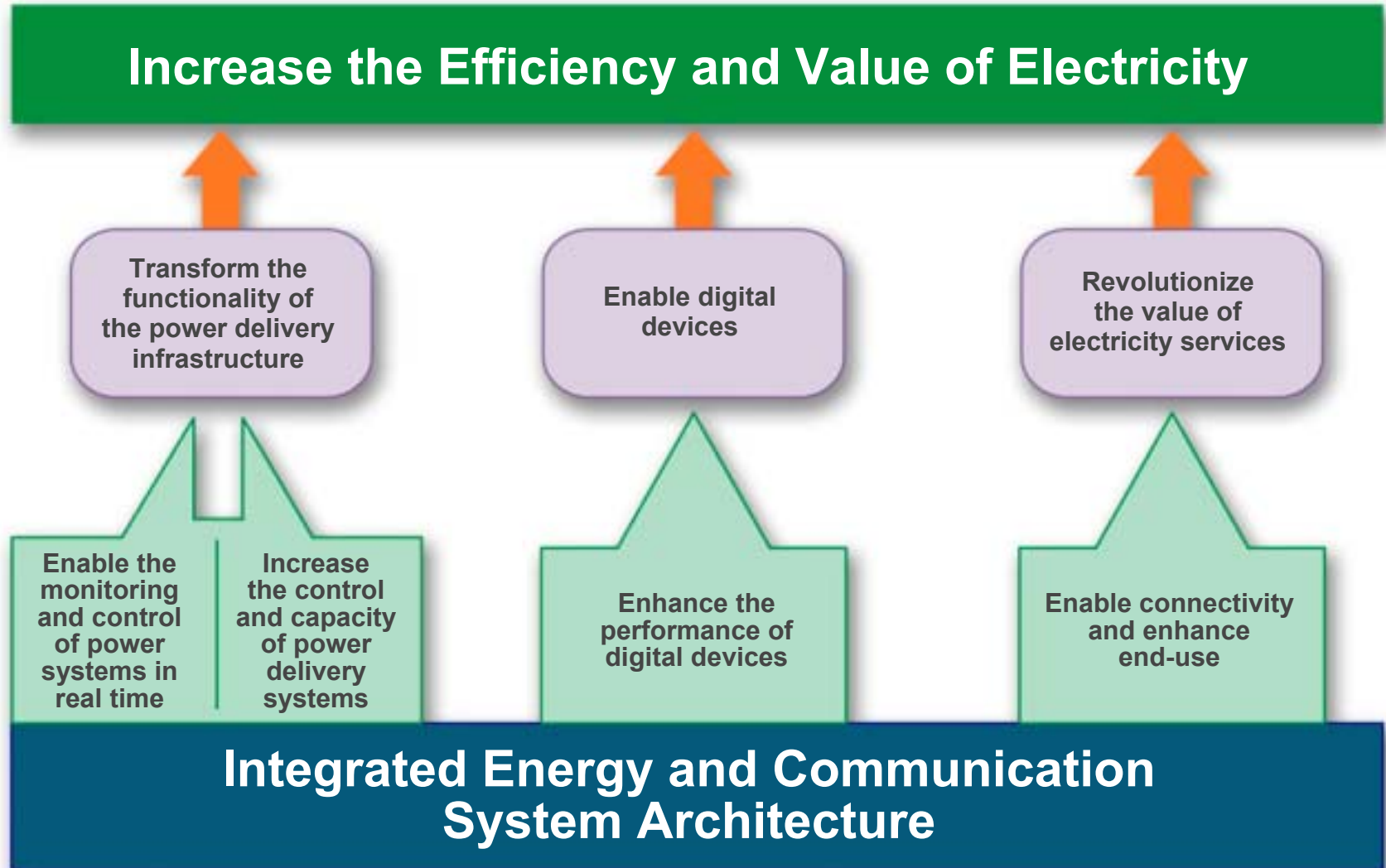
# Needed: An Interstate Electricity Communications Superhighway



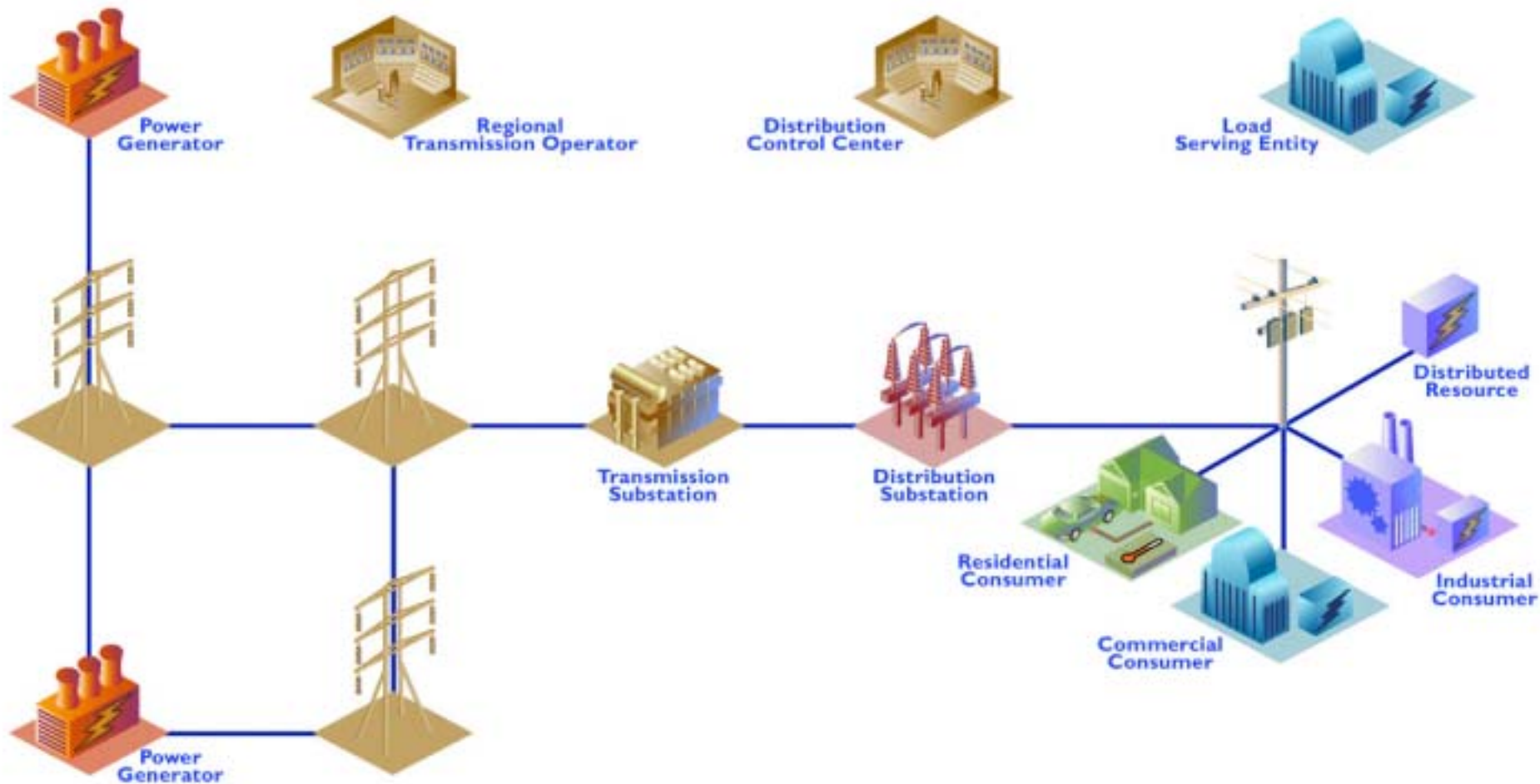
# Needed: An Interstate Electricity Communications Superhighway



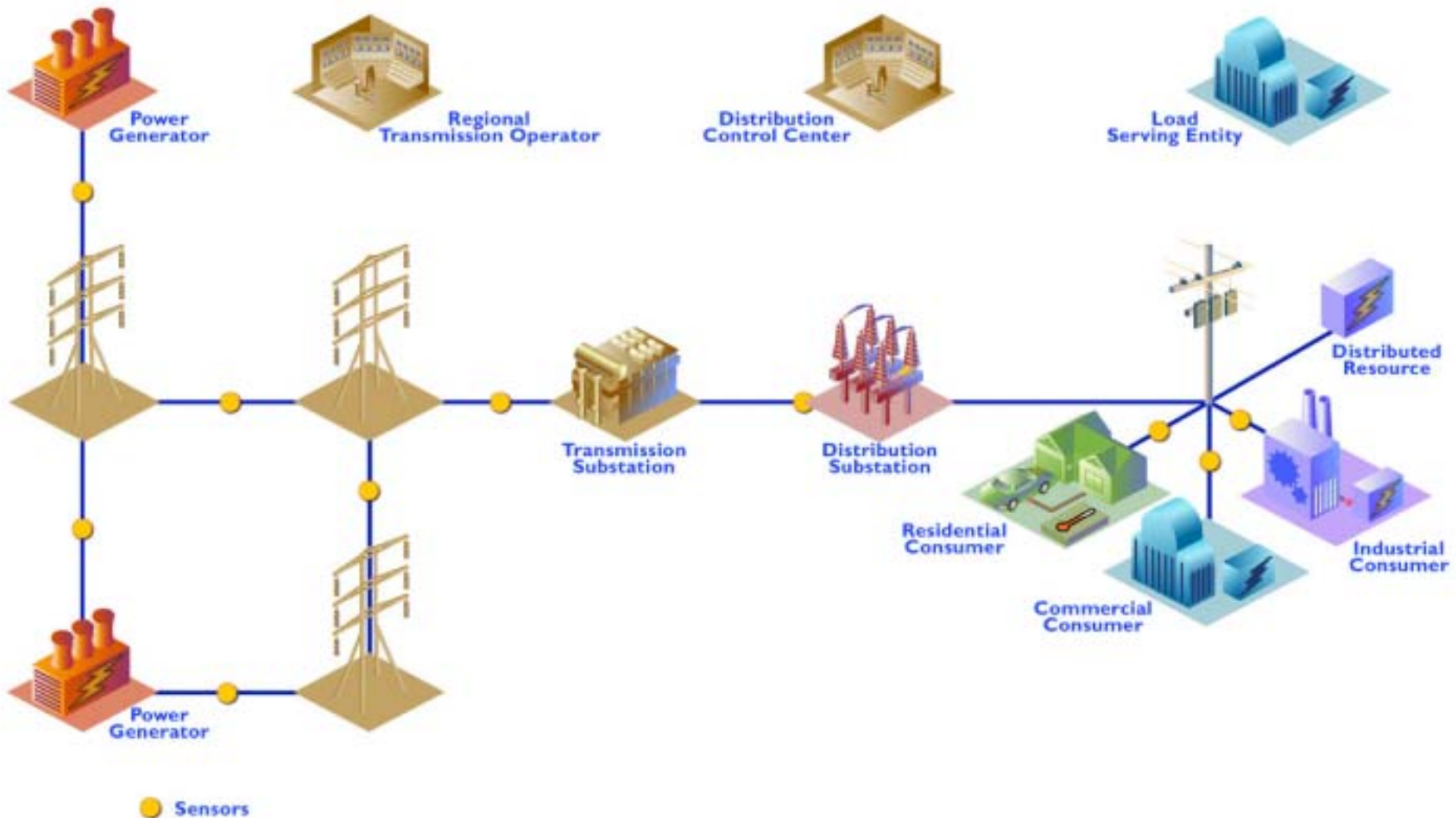
# A Descriptive Framework



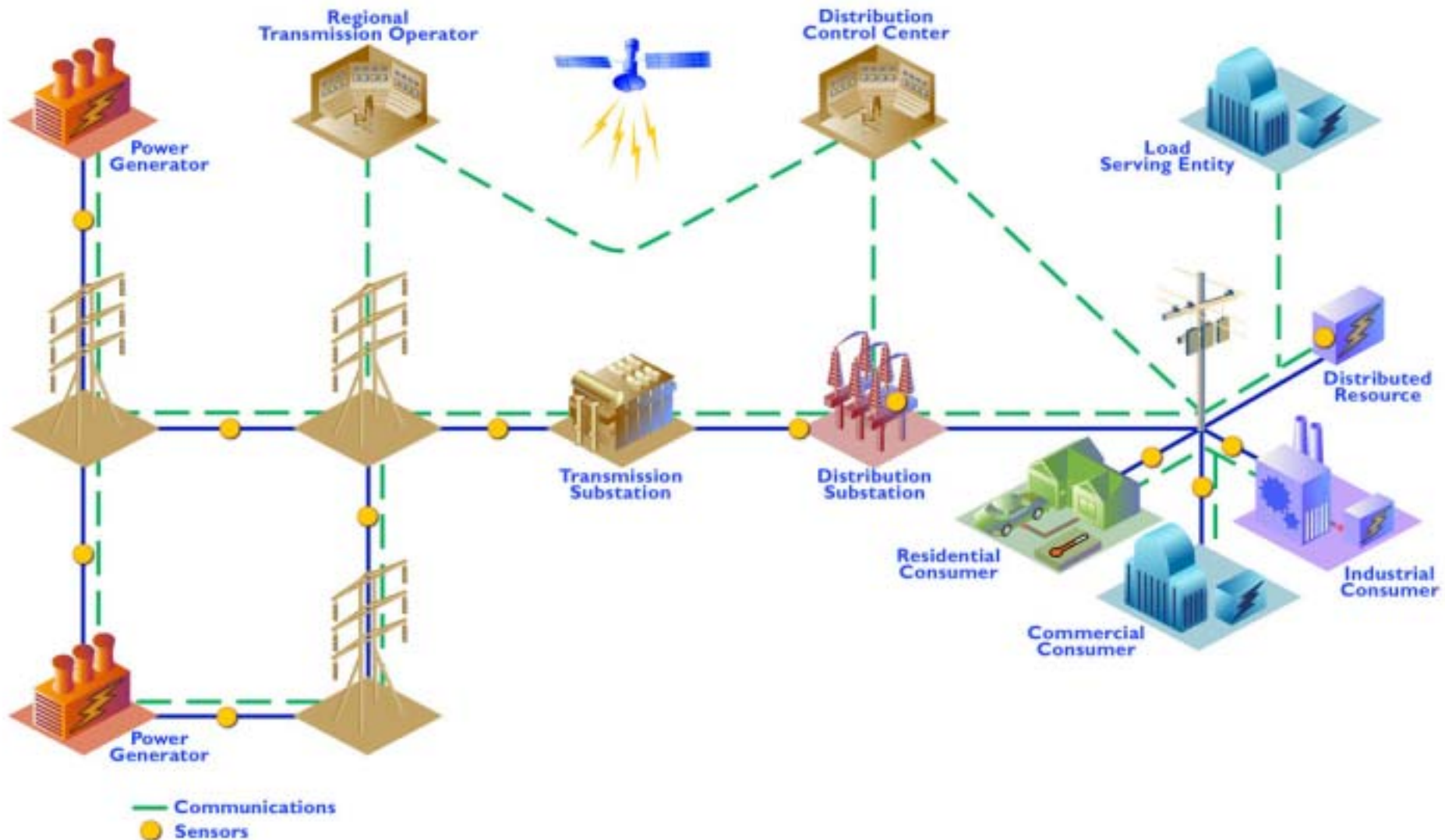
# Electric Infrastructure



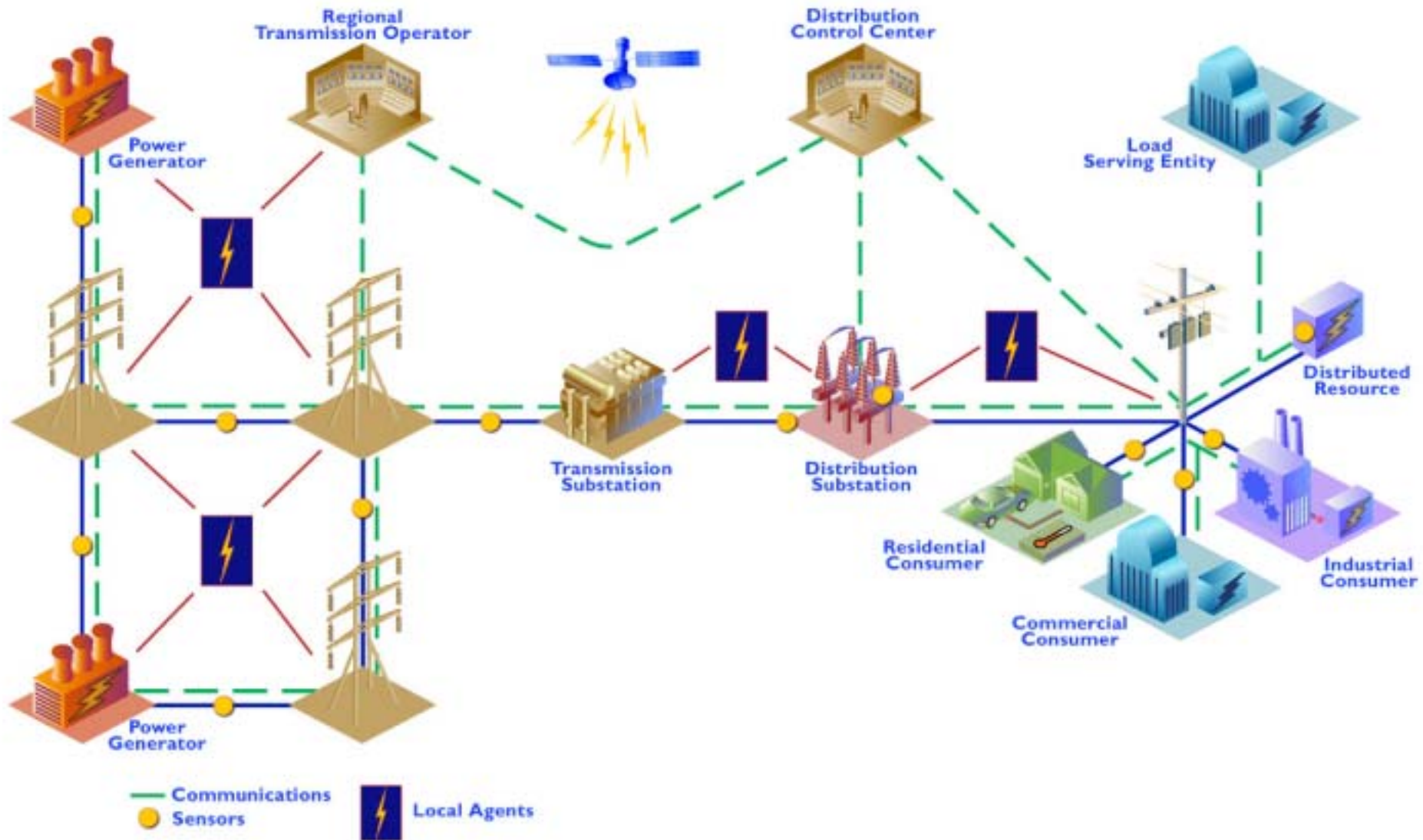
# Deploy Sensors



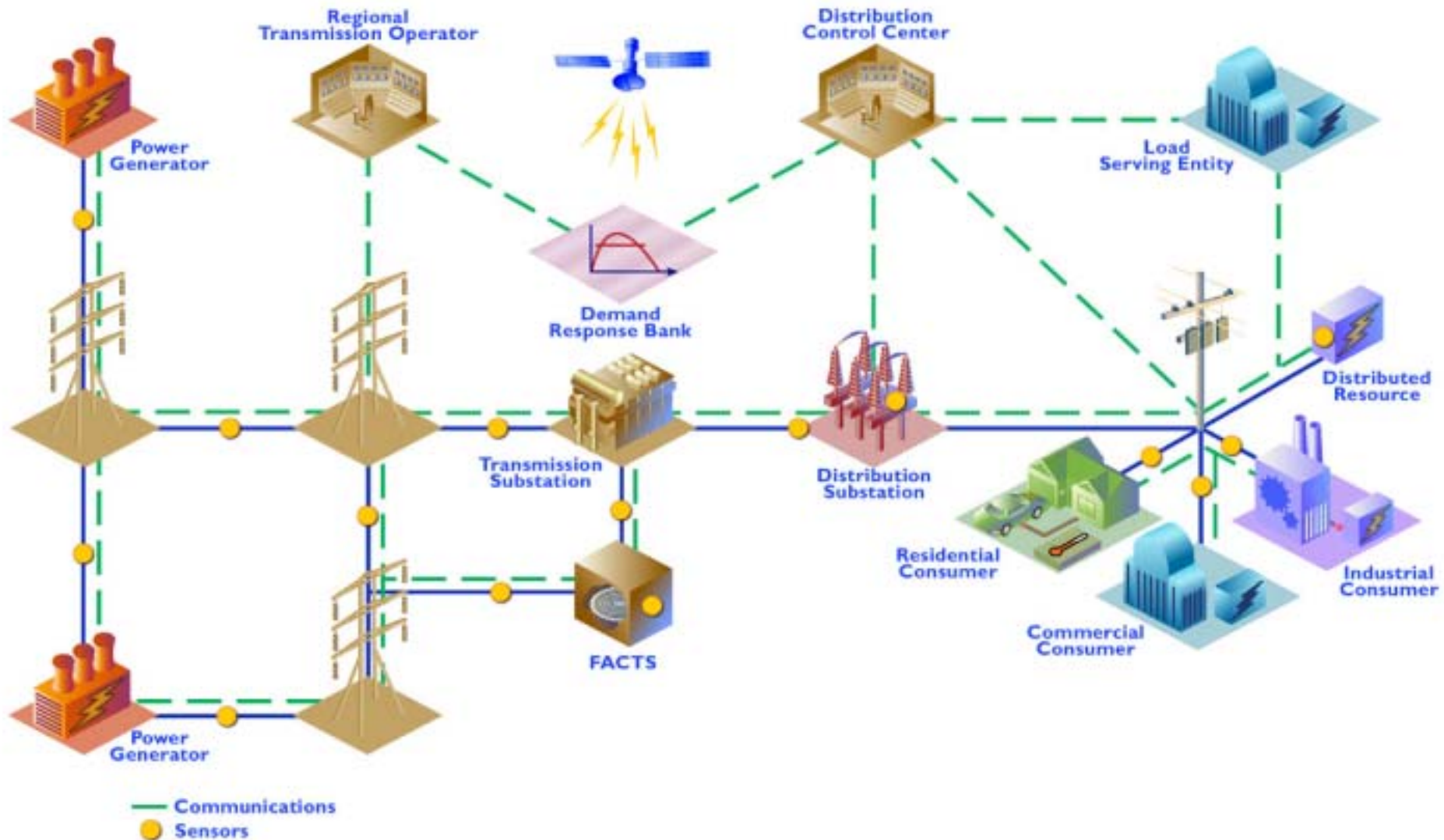
# Integrated Electric and Communications Systems



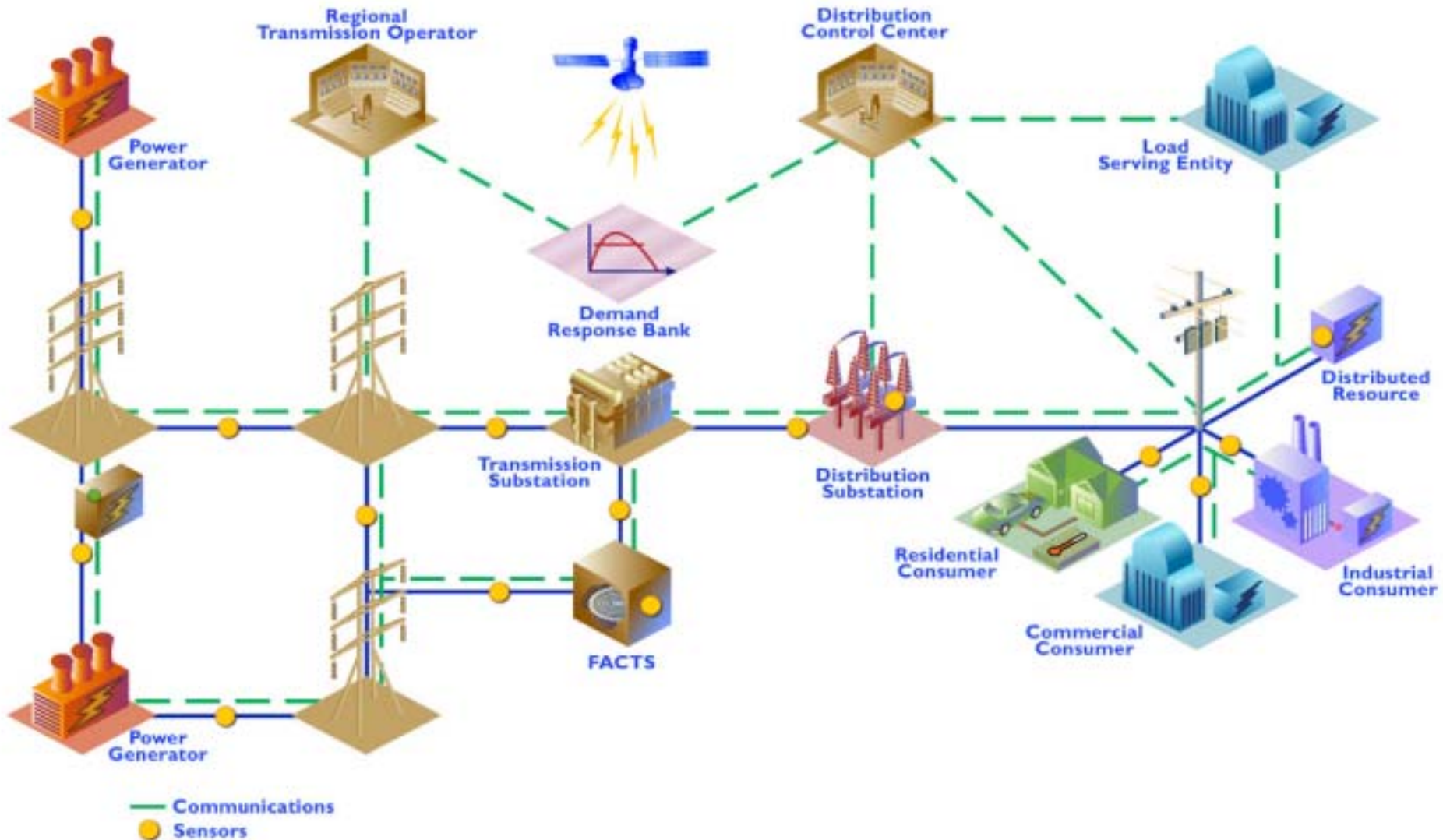
# Deploy Local Computational Agents



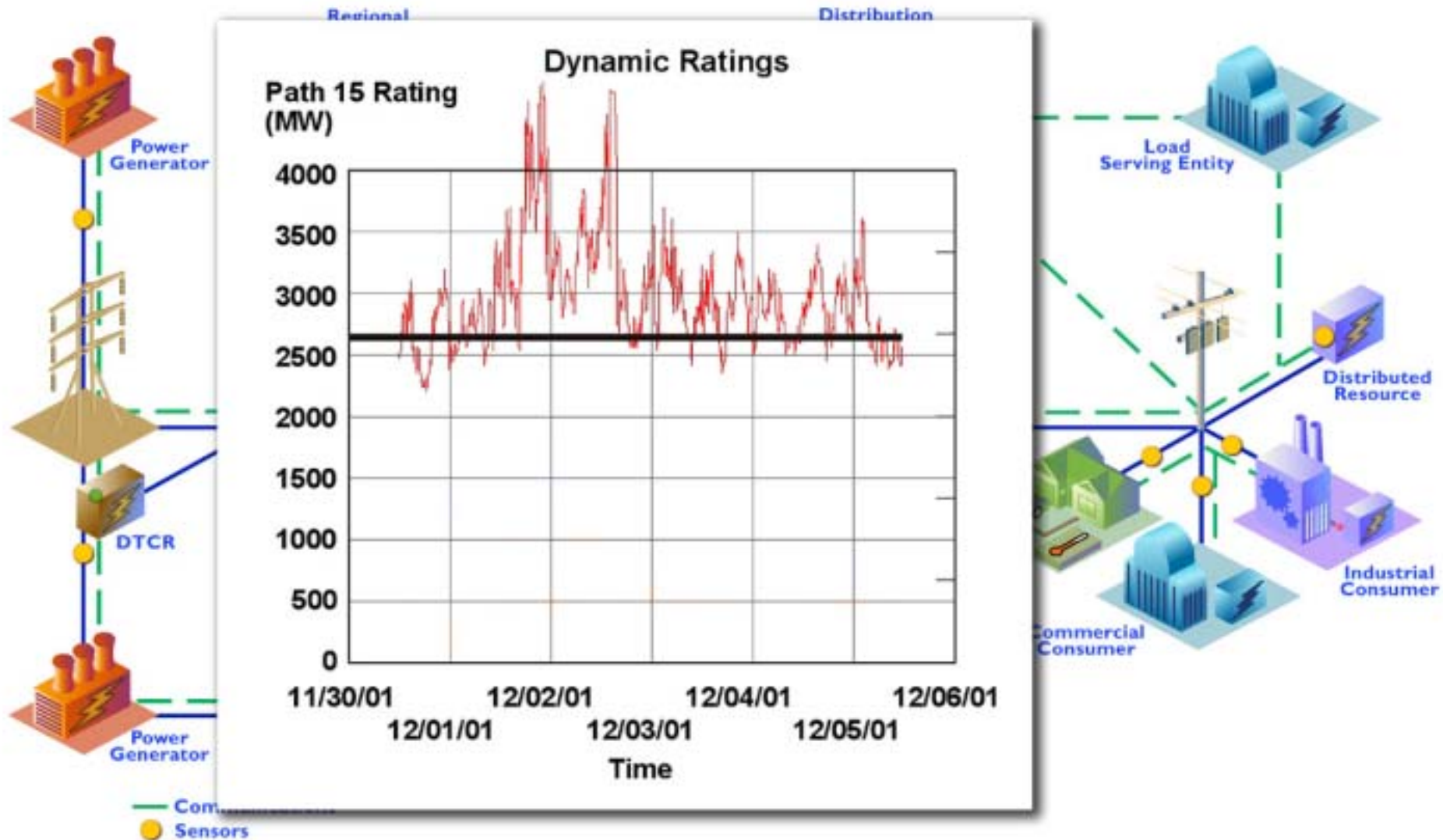
## Apply Power Flow Control



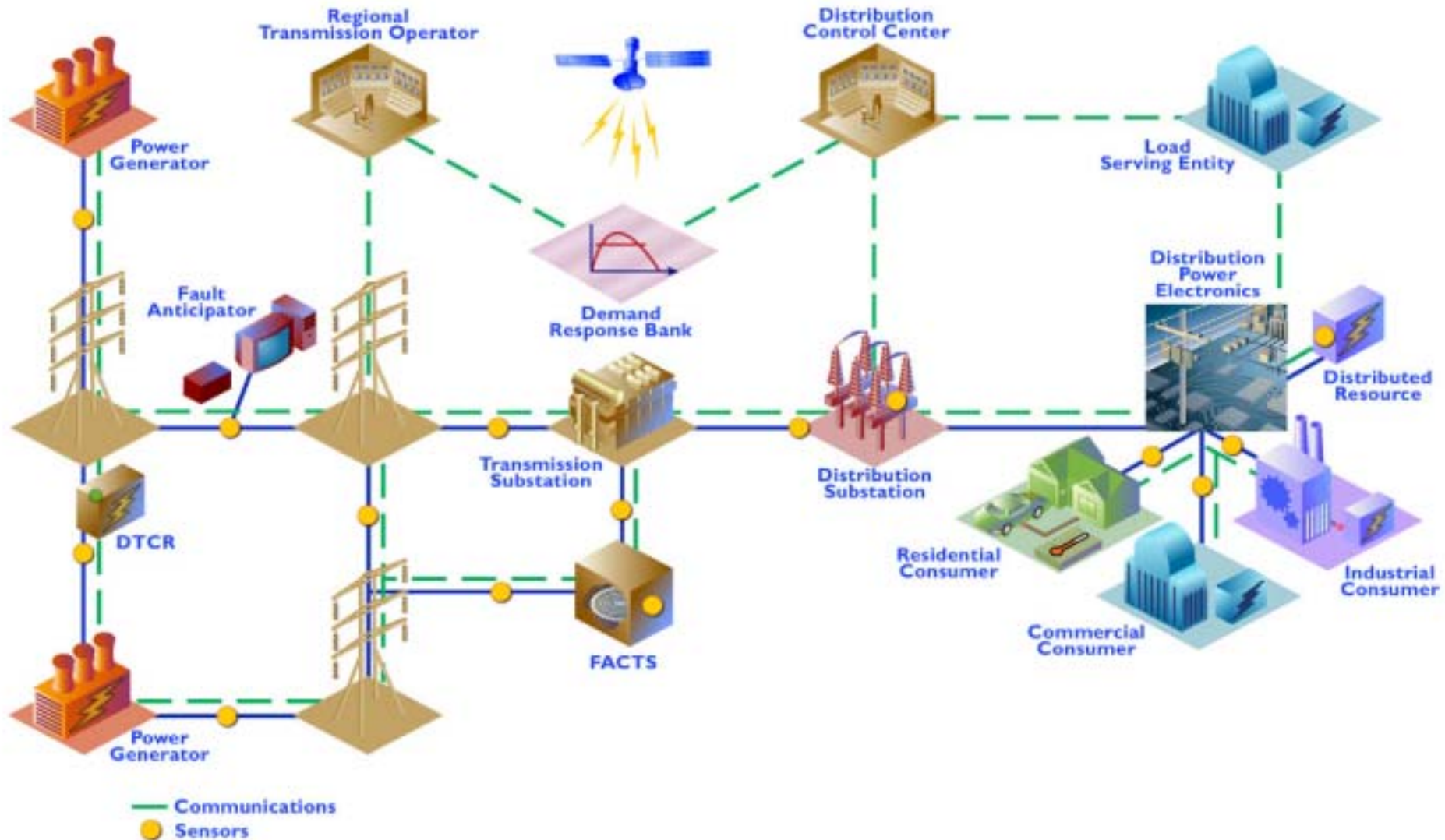
# Apply Dynamic Thermal Circuit Rating (DTCR)



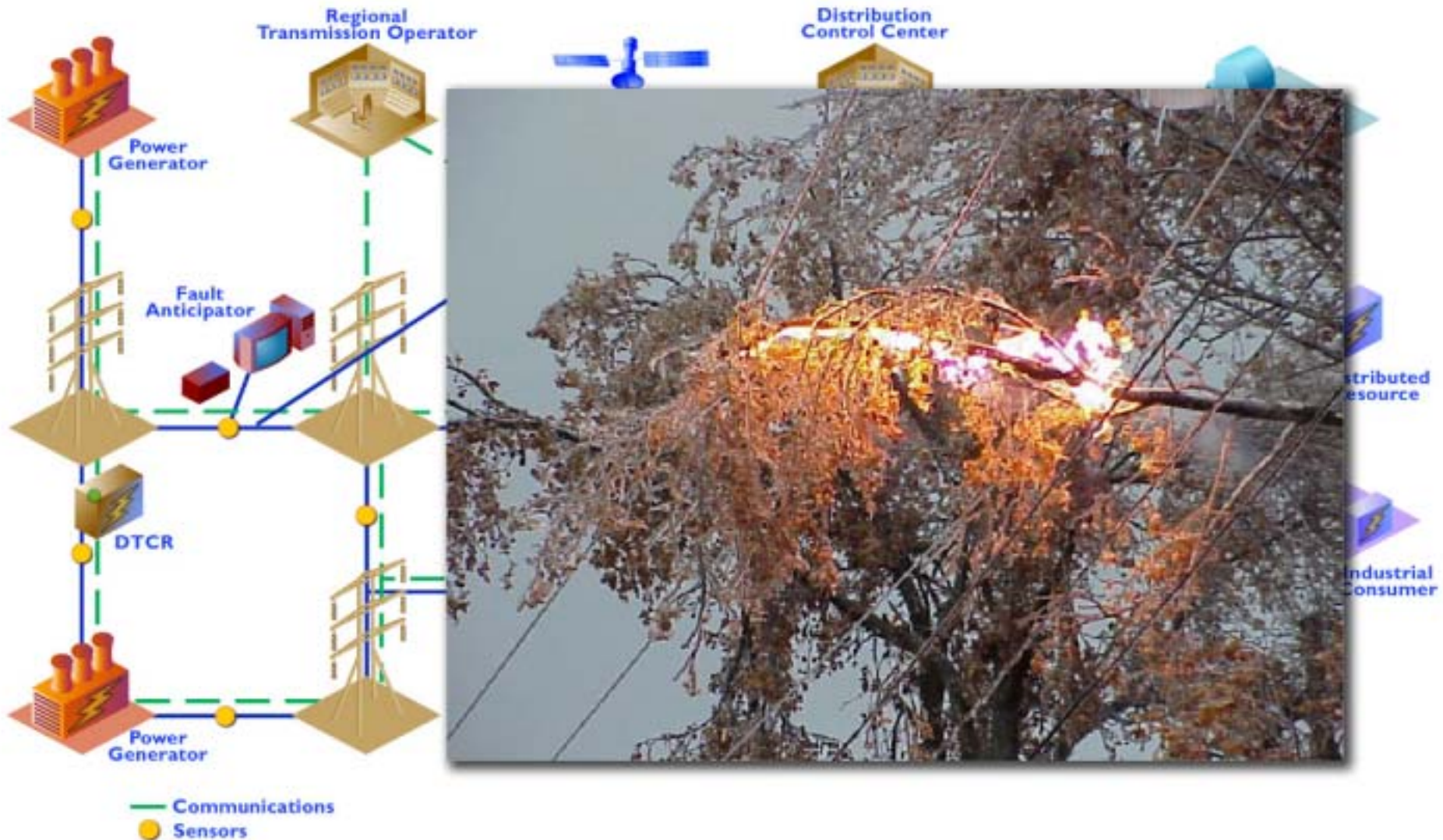
# Apply Dynamic Thermal Circuit Rating



# Apply Fault Anticipation & Distribution Electronics



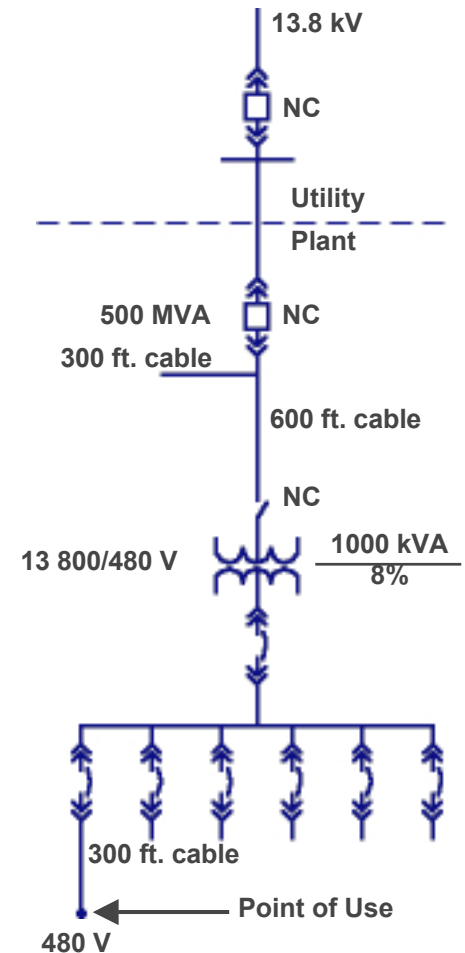
# Apply Fault Anticipation



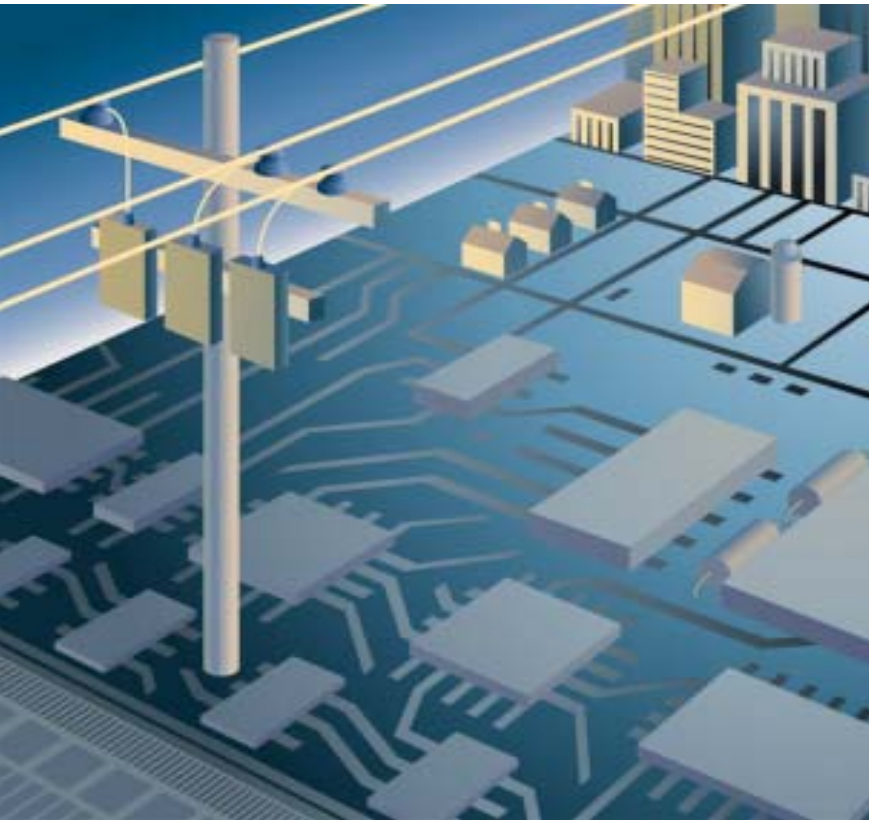
# The Smart Distribution System

Distribution Component	Forced Hours of Downtime/Year
13.8 kV power source from the electric utility	2.582
13.8 kV metalclad circuit breaker	0.2992
Cable (13.8 kV); 900 ft, conduit below ground	0.1458
Transformer	1.0260
All other (29 items)	0.2497
Total	<u>4.3033</u>

Availability =  $(8760 - 4.3033) / 8760 = 0.999$  (three 9's)



# The Smart Distribution System

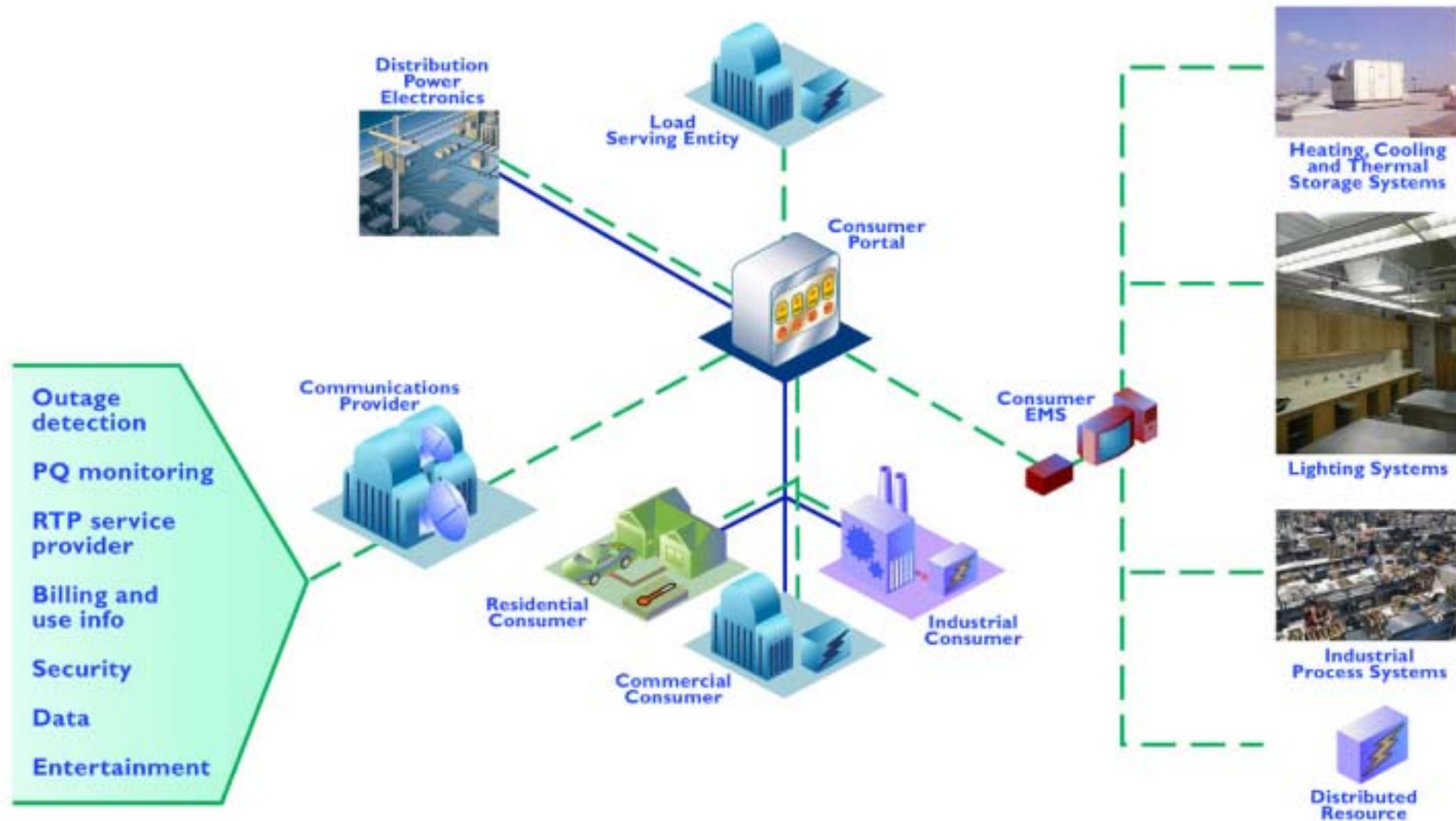


**Distribution Power  
Electronics**

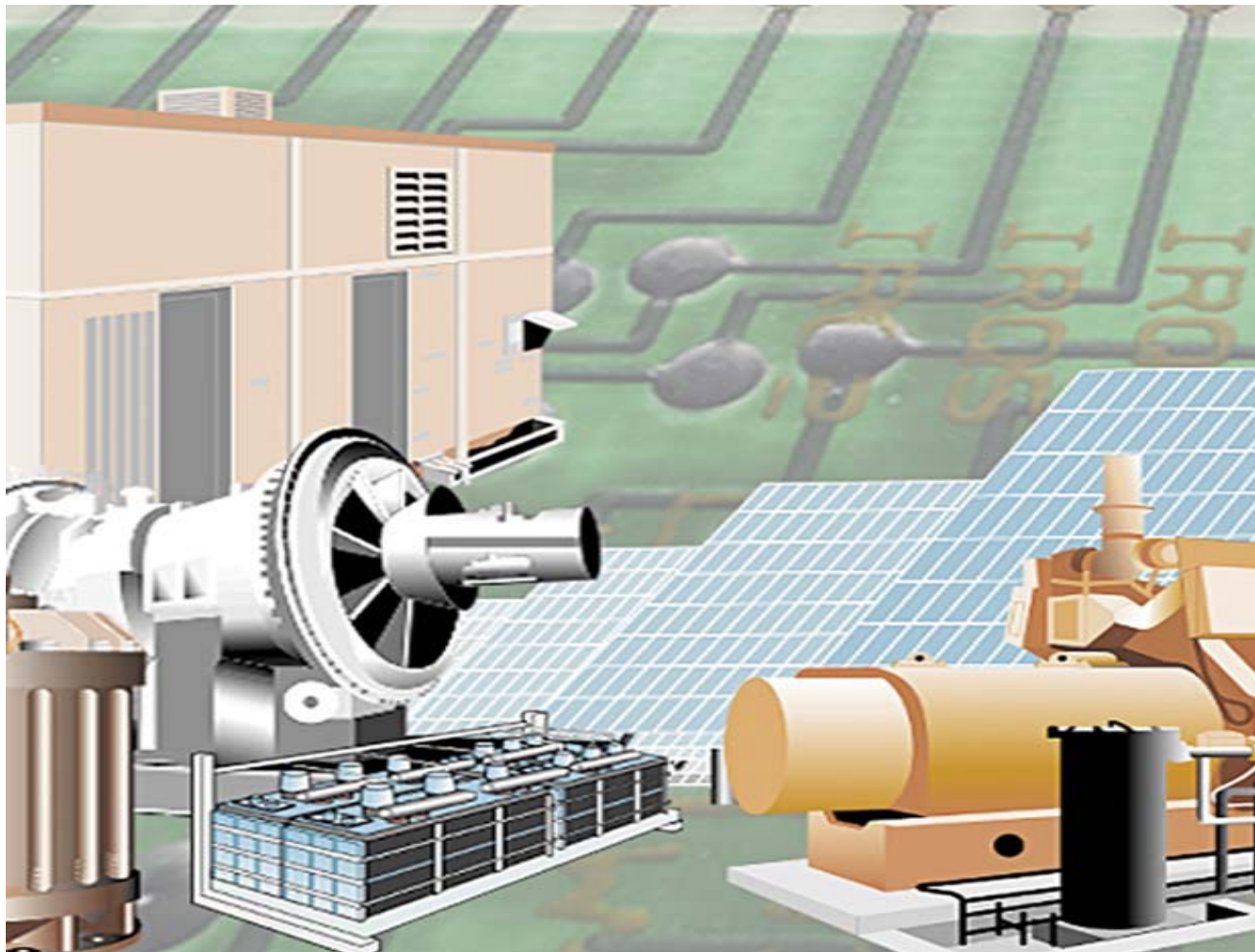


**3-G  
Distribution System**

# Consumer Portal

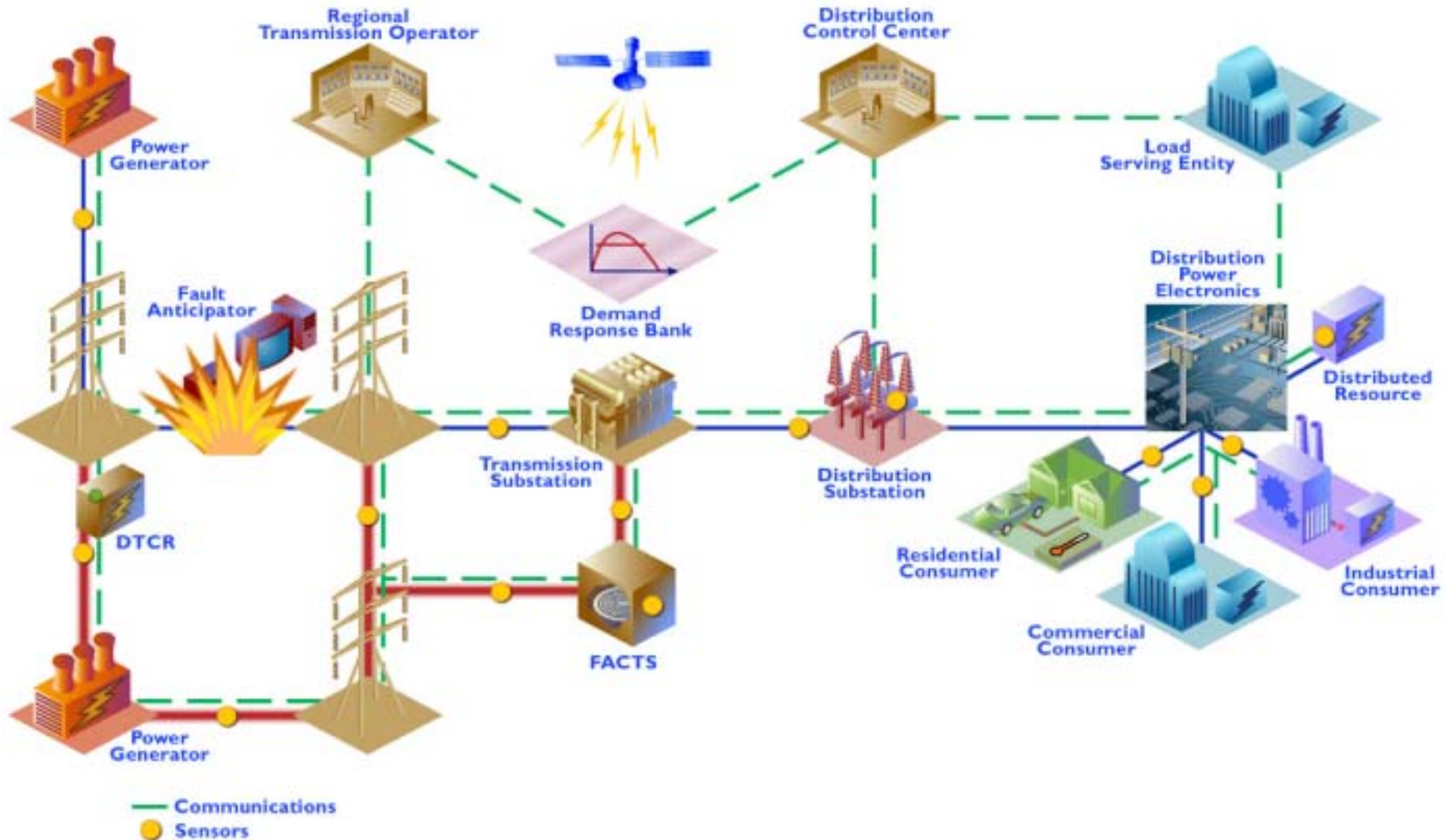


# The Smart Distribution System



## DR Integration

# Enable A Self-Healing Power Delivery System



# CEIDS Web Site



[Contact Us](#) [Site Map](#)



[CEIDS Home](#)

[About CEIDS](#)

[Technical Development](#)

[Partners](#)

[Information](#)

## Empowering the Digital Future

**Today's digital world** demands an availability and quality of electric power unimagined just years ago. You're always on and always connected-or else.

**To secure your place** in the wired century, EPRI and the Electricity Innovation Institute introduce CEIDS - the Consortium for Electric Infrastructure to Support a Digital Society. Participate in CEIDS, and join other energy firms, industrial consumers, and government agencies in leading-edge technology development to solve critical infrastructure challenges and thrive in the digital society.



Developing the science and technology that will ensure an adequate supply of high-quality, reliable electricity to meet the energy needs of the digital society

## What's New

- Press Release: [EPRI Recommends New Metrics for Characterizing the Performance of Power Delivery Systems](#)

- Read the executive summary of the new EPRI report on...

## Quick Link

[Online Collaborative Forum](#)

powered by



# www.epri.com/ceids